CASE REPORT

Transmural tracheal laceration during transhiatal esophagectomy for adenocarcinoma of esophagus

Ehsan Ahmad[1], Muhammad Shakeel Iqbal[2]

[1]*Resident;* [2]*Consultant*
Department of Anesthesia and Pain management, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, (Pakistan)

Correspondence: Dr Ehsan Ahmad, Resident, Department of Anaesthesia and pain management, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, (Pakistan); Cell: +92 345 4942626; E-mail; ehsanahmad814@gmail.com

ABSTRACT

We report a case of a patient undergoing transhiatal esophagectomy for carcinoma of lower one third of esophagus, who suffered intraoperative iatrogenic transmural tear of trachea just above the carina. This life threatening condition needed costal flap repair of tracheal laceration by thoracic surgeon. Early diagnosis, team approach by surgeons and anesthetists, and in time management are key elements for the survival and uneventful recovery of the patient.

Key words: Transhiatal esophagectomy; tracheal tear, adenocarcinoma esophagus

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INTRODUCTION

Transhiatal esophagectomy is one of the major surgical procedures indicated for both benign and malignant pathologies of esophagus. These include esophageal tumor of lower one third, close to the level of carina, achalasia, acute esophageal perforation, and scleroderma. Major complications associated with this procedure are hemorrhage, pleural effusion, tracheal injury and chylothorax.

CASE REPORT

A 70 years old male presented to our hospital with complaints of dysphagia and weight loss for last 6 months. He was investigated and latter diagnosed as having tumor of lower one third of esophagus. He was given multiple cycles of radiation therapy and then was scheduled for elective transhiatal esophagectomy under general anesthesia.

Pre operative anesthetic evaluation found no other comorbidities with normal BMI. Systemic examination was unremarkable. Baseline laboratory tests which included full blood count, urinary functions test, blood sugar, electrocardiography, pulmonary function tests and chest x-ray, were all within normal limits.

Patient was brought into operating room (OR) and standard monitors were applied. Thoracic epidural catheter was placed at T11-T12 space in sitting position in first attempt without any difficulty with LOR technique at 5 cm and catheter threaded for 10 cm at the skin. General anesthesia was induced with intravenous propofol 150 mg, morphine 7.5 mg, atracurium 40 mg, and glycopyrrolate 0.2 mg. After 3 min patient was intubated with size 8 endotracheal tube (ETT) and correct placement of ETT was confirmed by auscultation and capnography. Left radial artery was cannulated with 20G cannula for invasive blood pressure monitoring and central venous line of 7.5Fr triple lumen passed in right internal jugular vein under ultra sound guidance. Anesthesia was maintained with isoflurane 1.2% and 60% oxygen with air.

Surgery remained uneventful for 4 hours during which abdominal part was completed. During cervical mobilization of esophagus, surgeon started blunt dissection to separate adhesions of esophagus. At this point there was sudden gush of air from cervical incision and we were unable to ventilate the patient. Peak airway pressures dropped to zero and ventilator was unable to drive the bellows. Oxygen saturation was dropped to 75%, but patient remained hemodynamically stable. Fiberoptic bronchoscopy was

done without any delay and it showed tracheal injury just above the carina and was confirmed by surgeon's finger and also by direct visualization with fiberoptic bronchoscope. During this time tracheal rent was packed with gauze pads to prevent the leak and to help with ventilation.

There was approximately 5 cm transmural laceration of trachea just above the carina. Patient could not be ventilated with single lumen ETT, so left double lumen tube (DLT) of size 39Fr was passed under guidance of fiberoptic bronchoscope and one lung ventilation (OLV) was started. Oxygen saturation improved to 90%. Thoracic surgeon was called in to repair the tracheal rent.

Patient was placed in left lateral position and trachea repaired with intercostal muscle flap by the thoracic surgeon. Anesthesia was maintained with OLV during this period. Rest of esophageal resection completed uneventfully after tracheal repair. Patient was transferred to ICU, sedated and paralyzed, and was extubated after 48 hours in ICU.

DISCUSSION

Transhiatal esophagectomy is performed for benign and malignant conditions of the esophagus.[1] Iatrogenic tracheal tear is rare but a life threatening complication of esophagectomy. It occurs mostly with trans-hiatal approach and more commonly during cervical mobilization of esophagus. Overall incidence of tracheal injury during esophegectomy is around 4-10%[2] and less than 1% when the surgeon is well experienced.[3]

Tracheal rupture is suspected intra-operatively if there is a sudden loss of airway resistance, inability to maintain positive airway pressures, decreased oxygen saturation and large amount of air escaping through operative field. In our case tracheal injury was suspected by sudden gush of air from cervical incision and loss of airway resistance and it was further confirmed on direct visualization with fiberscope. Repair of tracheal laceration is started when patient is being well ventilated either with DLT or when defect is packed with gauze pads and repair is done in thoracotomy position.[4]

Usually transmural lacerations extending more than 2 cm need surgical repair.[5] Different ventilator techniques have been suggested for tracheobronchial repair including high frequency jet ventilation, high frequency positive pressure ventilation, or OLV, either with single lumen ETT or DLT.[6]

Postoperative management includes ventilation with small tidal volumes, low airway pressures and early extubation. We extubated our patient uneventfully after 48 hours of small tidal volume ventilation. Patient was shifted to surgical floor after 24 hours of extubation.

In case of transhiatal esophegectomy, OLV is usually not needed, still patient with esophageal tumors, due to close proximity to major airway and even those who are post radiotherapy status may benefit from electively placed DLT.

CONCLUSION

Tracheal and tracheobronchial injuries are rare but potentially fatal complications of transhiatal esophagectomies. Management of these airway injuries is challenging and failure to establish adequate ventilation can result in significant morbidity and mortality. Early recognition, maintenance of adequate ventilation, team approach with surgeons and proper postoperative care after repair of major airway injury are key points for successful management.

Conflict of Interest: None.

Authors' contribution: SI: review of the case report, EA: concept, manuscript writing, literature search and references

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